The causes of the long stagnation in Japan

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The paper investigates whether the Japanese bank lending causes the long stagnation in the 1990s and if so whether this effect on the growth is more persistent than in the 1980s. Applying a VAR model for the annual prefecture panel data, the former can be verified by Granger causality test and the latter by impulse response function. There exists only one way causality from the loan to the GDP in the slump periods, while two way causalities exist in the 1980s. The shock in the loan equation is less persistent than the shock in GDP in the 1980s, but the persistence is reversed in the 1990s.

I. INTRODUCTION

The Japanese financial intermediaries have never experienced failures until the end of the 1980s. However, the failure began to occur in the early 1990s and the number of failures rapidly increased to several tens in the late 1990s (see Table 1). Even though the number of failed banks is not so large, the three big banks with the 8th, 10th and 18th largest common stocks were included in the late 1990s. In order to avoid the bank’s failure and dispose the non-performing loan problem, the Japanese government injected the total amounts of 10 trillion yen to the 15 major banks and about 10 medium sized banks during the years of 1998–2000. Moreover, several banks merged each other in the late 1990s, and hence the number of banks lessened, compared with the 1980s. The burden of financial intermediaries seriously worsened in the late 1990s. On the other hand, the annual growth rate of GDP decreased to around 1% in the 1990s except for 1996, though the growth rate was 3.3% in the early 1980s and 5% in the late 1980s on average.

The above fact indicates the co-movement between the financial failures and the stagnation of economy. However, what are the causes of the long stagnation in Japan? There have been only a few academic researches on the causes. Motonishi and Yoshikawa (1999) find that real factors were principally responsible for sluggish investment in the period 1992–1994, but the credit crunch appeared after 1997 and lowered the growth rate of GDP by 1.6%. Meltzer (2001) argues that a decline in money growth caused the recession in early past of the decade while a decline in exports caused the recession in the later part of the decade. Hayashi and Prescott (2002) blame the slump on a slowdown of total factor productivity (TFP) but they do not explain why TFP declines. Their model does not include a financial sector. The researches suggest that multiple causes may have occurred over the decade of the 1990s. The long stagnation may not have been due to one cause and the dominant factor may have changed as the decade progressed. However, the previous researches do not provide conclusive evidence on the role played by bank lending in the growth slump.

The purpose of this paper is to investigate whether the bank lending is one cause for a long slump, that is, to give an answer to the two problems: the first one is whether the bank lending causes the economic growth, and the second one is whether the effect is persistent. A bivariate VAR model is employed for a prefecture panel data set of fiscal year 1975–1998. The first problem can be verified by a
Granger causality test. The impulse response function is applied for examining the second problem.

The empirical results show that the two problems are positively answered for the periods of 1990–1998 in which the Japanese banking industry is deteriorating. The results imply that the problems preventing more bank lending should be resolved.

The paper is organized as follows. Section II sketches the model and the statistical methodology. Section III describes the data and justifies the periods of structural change in the model. Section IV presents and discusses the empirical results. Section V states some conclusions.

II. MODEL, HYPOTHESES AND IMPULSE RESPONSE FUNCTION

The model

\( \mathbb{E}_{it} G^*_{it} \) and \( L^*_{it} \) are denoted as the (logarithm) measure of GDP and the (logarithm) measure of bank loans respectively for prefecture \( i \) at period \( t \). The detrended data \( y_{it} = (G_{it}, L_{it})' \) is used in the form:

\[
\begin{align*}
y_{it} = & \left( \begin{array}{c}
G_{it} \\
L_{it}
\end{array} \right) - \left( \begin{array}{c}
\alpha_{0G,i} \\
\alpha_{0L,i}
\end{array} \right) - \left( \begin{array}{c}
\alpha_{1G} \\
\alpha_{1L}
\end{array} \right) t - \left( \begin{array}{c}
\alpha_{2G} \\
\alpha_{2L}
\end{array} \right) \cdot \text{time trend}
\times D_{it} - \left( \begin{array}{c}
\alpha_{3G} \\
\alpha_{3L}
\end{array} \right) \cdot D_{2i} - \left( \begin{array}{c}
\alpha_{4G} \\
\alpha_{4L}
\end{array} \right) \cdot D_{1i} \cdot t - \left( \begin{array}{c}
\alpha_{5G} \\
\alpha_{5L}
\end{array} \right) \cdot \text{time trend}
\times D_{2i} \cdot t
\end{align*}
\]

where \( \alpha_{0G,i} \) and \( \alpha_{0L,i} \) are the individual prefecture effects, \( n \) and \( T \) respectively denote the numbers of prefectures and time periods. The time trend is a piecewise linear function kinked at times \( t_1 \) and \( t_2 \). Since the individual effects are deleted from the original data in Equation 1, the detrended data \( y_{ij}, i = 1, \ldots, n; t = 1, \ldots, T \) is interpreted as a pooling data set.

A pooling VAR \((k)\) model is applied with structural changes in coefficients at given periods \( t = t_1 \) and \( t = t_2 \):

\[
y_{it} = \sum_{j=1}^{k} (B_{0j} + B_{1j} \cdot D_{1i} + B_{2j} \cdot D_{2i}) y_{i,t-j} + \varepsilon_{it}
\]

\( \varepsilon_{it} : 2 \times 1 \sim i.i.d. N(0, \Sigma) \)

\[
\Sigma = \left( \begin{array}{cc}
\sigma^2_G & \rho \sigma_G \sigma_L \\
\rho \sigma_G \sigma_L & \sigma^2_L
\end{array} \right) \quad B_{0j} = \left( \begin{array}{c}
\beta_{h,1j} \\
\beta_{h,2j}
\end{array} \right) : h = 0, 1, 2
\]

(2)

The three periods divided by the two structural changes are distinguished. The lag length of the VAR is chosen by the SBIC (Schwarz’s Bayesian Information Criterion) and \( \hat{B}_{ij} \) estimated by the OLS:

\[
y_{it} = \sum_{j=1}^{k} (\hat{B}_{0j} + \hat{B}_{1j} \cdot D_{1i} + \hat{B}_{2j} \cdot D_{2i}) y_{i,t-j} + \hat{\varepsilon}_{it}
\]

\[
\hat{\Sigma} = \frac{1}{nT - 4k} \sum_{i=1}^{n} \hat{\varepsilon}_{it} \hat{\varepsilon}_{it}'
\]

Hypotheses and impulse response function

First, the existence of the structural changes is examined.

\( H_1 : B_{ij} = 0 \) for all \( j = 1, \ldots, k \) (4)

\( H_2 : B_{2j} = 0 \) for all \( j = 1, \ldots, k \) (5)

If the null hypothesis of \( H_i \) \((i=1, 2)\) is rejected, the structural change at \( t = t_i \) exists.

Second, the Granger causality for each of the three periods is investigated: Period I \( (0 \leq t < t_1) \), Period II \( (t_1 \leq t < t_2) \) and Period III \( (t_2 \leq t) \).

\( H_3 : \beta_{0,12j} = 0 \) for all \( j = 1, \ldots, k \) (6)

\( H_4 : \beta_{0,21j} = 0 \) for all \( j = 1, \ldots, k \) (7)

If \( H_3 \) (and/or \( H_4 \)) is rejected, the Granger causality from \( L \) to \( G \) (and/or from \( G \) to \( L \)) exists for Period I.

\( H_5 : \beta_{0,12j} + \beta_{1,12j} = 0 \) for all \( j = 1, \ldots, k \) (8)

\( H_6 : \beta_{0,21j} + \beta_{1,21j} = 0 \) for all \( j = 1, \ldots, k \) (9)
The causes of the long stagnation

If $H_3$ (and/or $H_8$) is rejected, the Granger causality from $L$ to $G$ (and/or from $G$ to $L$) exists for Period II.

\[ H_7: \beta_{0,12j} + \beta_{2,12j} = 0 \quad \text{for all } j = 1, \ldots, k \]  
\[ H_8: \beta_{0,21j} + \beta_{2,21j} = 0 \quad \text{for all } j = 1, \ldots, k \]

Similarly, if $H_7$ (and/or $H_8$) is rejected, the Granger causality from $L$ to $G$ (and/or from $G$ to $L$) exists for Period III.

The problem whether the amount of loans causes the economic growth can be tested through the hypotheses $H_7$ to $H_8$. Interest is in the two ways causality between $G$ and $L$ for each of Periods I–III.

Third, whether the effect of bank lending on the economic growth is persistent is examined. The effect in terms of the impulse response function is examined which was originally introduced by Sims (1980). The impulse response function based on the model Equation 2 is expressed as

\[
y^{(p)}_t = \sum_{j=1}^{k} (\hat{B}_{0j} + \hat{B}_{1j} D_{1t} + \hat{B}_{2j} D_{2t}) y^{(p)}_{t-j} \]

\[
y^{(p)}_{t-j} = 0 \quad \text{for } t - j < 0, \quad y^{(p)}_0 = \epsilon^{(p)}_0, \quad p = G, L
\]

where $y^{(p)}_t$ is a response at time $t$ to the impulse $\epsilon^{(p)}_0$. The suffix $i$ for prefecture is omitted from Equation 12, because the magnitudes of response are identical for all prefectures. Since the error terms in Equation 2 allow non-zero correlation and their variances are not necessary equal, care must be taken to choose the magnitudes of impulses. Noting that the error terms in Equation 2 can be expressed as

\[
\epsilon_t = \left( (1 - \rho^2)^{1/2} \sigma_G, \rho \sigma_G, \frac{u_{1t}}{\sigma_L} \right) \]

(i) $G$-impulse is chosen as $u_0 = (1, 0)'$, i.e., $\epsilon^{(G)}_0 = ((1 - \rho^2)^{1/2} \sigma_G, 0)'$, and (ii) $L$-impulse chosen as $u_0 = (0, 1)'$, i.e., $\epsilon^{(L)}_0 = (\rho \sigma_G, \sigma_L)'$.

Focus is only on the $G$ response against the $G$ impulse ($y^{(G)}_t$) and that against the $L$ impulse ($y^{(L)}_t$) in Equation 12, since the main interest is in the effect of financial institutions on the real economy. A persistency measure of the $G$ response against the $p$ impulse is defined as follows:

\[
PMR(p, m) = \sum_{t=m}^{\infty} |y^{(p)}_{1t}| \quad (14)
\]

The persistency measure $PMR(p, m)$ indicates the sum of absolute values of response at time $t$ over $m$ periods ahead or more when a $p$ impulse is given at time zero. If the inequality $PMR(L, m) > PMR(G, m)$ holds, the $G$ response against the $L$ impulse is more persistent than that against the $G$ impulse.

III. DATA AND STRUCTURAL CHANGE POINTS

Data source

This section describes the data source and their basic properties, thereafter determine the periods of structural change in the model based on the shape of trend function of the data series, and on the important historical events.

The annual Japanese prefecture panel data set are used in the logarithm form of gross domestic real product (GDP) and in the logarithm form of real loan (discounted by the deflator). The GDP and loan are measured in a million Japanese yen. The publication of prefecture data began to be published from the fiscal year 1975, and the latest available data is of 1998 since the prefecture’s GDP goes public with 2 years lag. The data sources of the deflator and the GDP are Deflator of Prefectural Domestic Expenditure, and Gross Prefectural Domestic Expenditure at constant prices in Economic and Social Research Institute (2001).

The loan consists of all credits created by the Domestically Licensed Banks (i.e., City banks, Regional banks I, II, Long-term credit banks, and Trust banks). Loan by other financial institutions (Shinkin banks, Shoko Chukin banks, and Credit Cooperatives) are excluded from the analysis in the following reasons. The amounts of loans made by these institutions are marginal compared with those by the former institutions. The Bank of Japan closed down the publication of the prefecture data for the loan created by the Shinkin banks and the Credit Cooperatives in the 1996 fiscal year. The data source is Deposit, Loans and Discounts Outstanding of Domestically Licensed Banks in the Bank of Japan (1999). The 41 prefecture data are available for analysis.


3 The mutual loan and savings banks began to be gradually converted to the regional banks II after the Bank Acts of Japan was enforced in February 1989. The conversion had been completed until April 1992. The data for the regional banks II are the ones of the mutual loan and savings banks until February 1989.

4 The missing of the Deflator for Fukushima, Saitama, Toyama, Hyogo, Okayama, and Okinawa prefectures in several years lead to omit these prefectures from the analysis.
Nature of the data and determination of structural change points

The nature of data prior to statistical analysis is briefly looked at. Figure 1 presents the graphs on the logarithm form of the original panel data \( \left( G_{it}, L_{it} \right) \). The centred line (mean) in each graph displays the average amounts over the prefectures at each period. The top and bottom lines are respectively the mean + 2sigma and the mean – 2sigma (sigma = standard error at each period). The bundle between the two lines roughly covers 95% of prefectures at each period. Figure 1 suggests positively correlated movements of GDP and loan, but the wide range of 95% bundle may allow negatively correlated movements. In fact, for the period from the fiscal year 1997–1998, 22 prefectures observed the decrease of both GDP and loan, 16 prefectures observed the decrease of GDP and increase of loan, two prefectures experienced the increase of both GDP and loan, and one prefecture with increase of GDP but decrease of loan. If the loan is aggregated to the national data, the decrease (23 prefectures) and the increase (18 prefectures) will cancel out. Thus, the disaggregated prefecture data may be useful to reveal the so-called microstructure of causality.

From the visual inspection of Fig. 1, the data seems to exhibit a time trend with some kinked points. Both loan and GDP have a relatively obvious break point around 1990. On the other hand, the loan might have an upsurge in the early 1980s even though it is not as clear as in the year around 1990. It is presupposed that the two structural changes at the periods of 1983 and 1990 are based on the above visual observation, and on the historical events explained in the following. The data periods are divided into Period I (1975–1982), Period II (1983–1989) and Period I (1990–1998). The time span of empirical data in this study is from 1975 to 1998, which roughly corresponds to the periods of floating exchange rate system. During these periods, the Japanese economy went into the financial deregulation process, experienced a so-called bubble economy, and suffered from the bubble burst and its subsequent depression.

It is thought that the US president Ronald Reagan’s visit to Japan in November 1983 remarks an epoch-making event. The deregulation process was greatly accelerated after his strong request of opening the Japanese financial institution. In January 1984, the Nikkei 225 hit a post-war high of ten thousands Japanese yen. By the Plaza Accord in September 1985, the Japanese yen had appreciated from 237.10 yen per US dollar in August 1985 to 179.65 per US dollar in March 1986 (in the central rate average on month). Then, the export decreased for a few years in the aftermath. To stimulate investments, the official discount rates were decreased from 5% to 3% through January to November in 1986. Such a monetary relaxation induced a dramatic increase of security prices and land prices. The period from 1983 to 1989 (Period II) is referred to as the bubble economy period.

The Japanese economy in the 1990s is clearly distinguished from those in the 1980s by many historical events. Here, a few examples are referred to the peak of the average stock price of Nikkei 225 (38,915 yen) in December 1989 was the beginning of collapse of the bubble economy, which triggered the subsequent crisis of financial intermediations. The Specific Housing Loan Companies failed in December 1995 because of extravagant speculations for land. The 700 billion yen of tax were injected into the Specific Housing Loan Companies to purchase the bad debt of those companies. This failure is a symbol of tremendous speculation for land by financial intermediaries. The Hokkaido Takushoku Bank (then one of the ten city banks) and the Yamaichi security company (one of the then big four security companies) went bankrupt in 1997. The Long-Term Credit Bank of Japan and the Nippon Credit Bank (two of the three long-term credit banks) collapsed in 1998. The Period III is referred to as the financial slump period.

Figure 2 presents the graphs of the detrended data \( (G_{it}, L_{it}) \). The detrended series move much more vigorously than original data series. The detrended series will be analysed.

4. RESULTS OF ESTIMATION AND TESTS

The SBIC is used to determine the lag length of VAR out of five lags. Table 2 shows that the optimal lag is two. The
A likelihood ratio test was performed for the hypotheses of structural changes in 1983 and 1990. Both null hypotheses of $H_1$ and $H_2$ are rejected (see Table 2). It was possible to apply the model Equation 2 with structural breaks at the periods of 1983 and 1990 for testing the Granger causality at each of the three periods: Period I (1975–1982), Period II (1983–1989) and Period III (1990–1998).

Table 3 presents the estimates of coefficients for the VAR system. Most of coefficients are significant at 5% levels. The Durbin–Watson statistic for each Equation in Equation 2 is nearly 2.0, implying the serially no correlated error terms. The adjusted $R$-square is about 0.8, which means reasonable fitness of the model to the observed data. Table 4 shows the results of Granger-causality tests for each of the three periods. There are bidirectional causalities between $L$ and $G$ for both Periods I and II. However, for Period III, there is only one-directional causality from $L$ to $G$. The reverse causality from $G$ to $L$ disappears in Period III. The sum of coefficients for $L$ in the $G$ equation of Equation 2 becomes larger in Period III compared with other two periods, while the sum of coefficients for $G$ in the $L$ equation becomes smaller. That is, the effects of $G$ ($L$) on $L$ ($G$) become negative (positive).

The result has the following policy implication. As briefly stated in Section III, Period III is characterized by the banking slump. The more lending causes the economic growth in this period, while the reverse causality does not exist. In order to revitalize the Japanese economy, the government intervention for some problems preventing more lending may be rationalized.
The measure of persistence defined by Equation 14 is examined. Figure 2 shows the GDP response functions by the GDP and LOAN impulses for each period of I, II and III. The three columns in Table 5 shows the values of \( PMR(L, m) \) and \( PMR(G, m) \) for \( m = 1, 2, \) and 3. First, \( PMR(L, m) \) is compared with \( PMR(G, m) \). It is observed that \( PMR(L, m) < PMR(G, m) \) for all \( m = 1, 2, \) and 3 in Periods I and II. However, as for Period III, the persistence measure shows different characteristics from those for Periods I and II. It is seen that \( PMR(L, 1) < PMR(G, 1) \), but the inequality reverses to \( PMR(L, m) < PMR(G, m) \) for \( m = 2, \) and 3. Second, the changes of \( PMR(L, m) \) and \( PMR(G, m) \) along with time period are considered. The value of \( PMR(L, m) \) increases along with the period and the value of period III is four times larger than the other periods. On the other hand, the values of \( PMR(G, m) \) for Period III are less than those for Period II. The result indicates that the \( G \) responses against the \( L \) impulse are persistent compared with those against the \( G \) impulse for Period III. In other word, the shock occurred in the loan equation of Equation 2 continues to affect the levels of GDP for longer times than the shock occurred in the GDP equation of Equation 2 does for the banking slump period.

Two main empirical facts were found about the Japanese economy in the 1990s in this section. Discussion about the economic reasoning for the empirical results is in order.\(^6\) Why is it that GDP no longer causes loans in Period III? It is expectations of future GDP growth that affects loans. In a period of economic stagnation, current and past GDP growth may no longer be a suitable proxy for future GDP. The previous researches believe that large firms were not credit-constrained, since they are able to substitute nonbank sources of funds. However, in the financial slump period, the switch might have been induced or accelerated by bank instability and the credit constraint might well have had real effects for even large firms. Therefore, the sum of coefficients for all \( L \) (loan variables) might have increased from \(-0.008\) in Period I to \(0.004\) in Period III, as seen in

| Table 2. Optimal lag length and tests for structural change |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Lag SBIC\(^a\): | 1 | 2 | 3 | 4 | 5 |
| Hypothesis\(^b\): | d.f. | \( \chi^2(8) \) | p-value | 80.20 | 1.00 |
| Hypothesis\(^c\): | 1983 | 40.37 | 0.00 |
| Hypothesis\(^d\): | 1990 | 131.36 | 0.00 |

\(^a\) SBIC = log |\( \hat{\Sigma} \) + \( \bar{Q} \log(nT)/(nT) \)\( |\( \hat{\Sigma} \) \) \( \bar{Q} \) \( nT \) \( (nT) \) is a multivariable variation where \( \hat{\Sigma} \) is a covariance matrix and \( \bar{Q} \) is the number of explanatory variables in the VAR model of Equation 2. \(^b\) The likelihood ratio statistic is \( (nT - e)(\log |\( \hat{\Sigma} \) \| - \log |\( \hat{\Sigma} \) \|) \) where \( |\( \hat{\Sigma} \) \| \) are the restricted and unrestricted covariance matrices. The \( e \) is a correction to improve small sample properties. Sims (1980, p. 17) suggests a correction equal to the number of variables in each of the unrestricted equations in the system.

| Table 3. Estimated coefficients of the VAR model |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Eq. | \( G_{t-1} \) | \( G_{t-2} \) | \( L_{t-1} \) | \( L_{t-2} \) | \( D_{1t} \cdot G_{t-1} \) | \( D_{1t} \cdot G_{t-2} \) |
| \( G_t \) | 0.619 | 0.187 | 0.086 | -0.094 | 0.327 | -0.217 |
| (11.21) | (3.86) | (2.39) | (-2.87) | (4.20) | (-2.76) |
| \( L_t \) | -0.248 | 0.296 | 1.112 | -0.228 | 1.091 | -0.295 |
| (-2.20) | (2.99) | (15.14) | (-3.42) | (6.84) | (-1.84) |
| \( D_{1t} \cdot L_{t-1} \) | -0.082 | 0.043 | 0.277 | -0.240 | 0.103 | -0.091 |
| (-2.25) | (1.19) | (3.46) | (-3.04) | (2.03) | (-1.82) |
| \( L_t \) | -0.436 | -0.094 | 0.317 | -0.414 | 0.233 | -0.163 |
| (-5.84) | (-1.29) | (1.94) | (-2.57) | (2.26) | (-1.59) |

Notes: The entries are estimates of coefficients on the GDP and LOAN equation in the VAR model, the values in the parentheses denote t-statistics. The \( G_{t-1} \) and \( L_{t-1} \) denote variables with 1-lag length of \( G_t \) and \( L_t \), respectively. The \( D_{1t} \cdot G_{t-1} \) and \( D_{1t} \cdot L_{t-1} \) denote variables with dummy of \( D_{1t} \). The \( D_{2t} \cdot G_{t-1} \) and \( D_{2t} \cdot L_{t-1} \) denote variables with dummy of \( D_{2t} \). The estimates of standard deviations and correlation coefficients of the error terms are respectively \( \sigma_G = 0.0239 \) \( \sigma_L = 0.0488 \) and \( \rho = 0.3377 \). The adjusted R-squares are 0.78 and 0.79 for the \( G \) and \( L \) equations respectively when OLS is implemented to each equation. The Durbin–Watson ratios are 1.99 and 1.98.

\(^6\) Following Aoki and Patrick (1994, pp. 3–4), a main bank relationship is a long-term relationship between a firm and a particular bank from which the firm obtains its largest share of borrowings. This bank is called a main bank. In Japan the main bank plays an important role of corporate monitoring, governance and protection against the take-over for the firms. In spite of rapid securitization of corporate financing, the main bank still remains to be the core stockholder for firms and so there is no sign of the development of an active take-over mechanism. The main bank system may be worthy of being considered as one of the reasons to explain the results. These tasks are left to future research.
Also, in Table 5, the $G$ response against $L$ impulse is more persistent as the year progress.

The break points are assumed to be known before the analysis of the model. But, in reality, the true break points are not known. Hence, it is meaningful to examine the effects of moving the points of structural changes upon the Granger causality and the impulse response function.

The four sets of structural changes are investigated: Case (a) in which the changes are assumed to occur in 1983 and 1989, Case (b) in 1983 and 1991, Case (c) in 1982 and 1990, and Case (d) in 1984 and 1990. Table 6A shows the effects on Granger causality. As for Period III, the testing results for Cases (b), (c) and (d) are the same as that of Table 4. Table 6B shows the effects on the impulse response function. The values of $PMR(L, m)$ and $PMR(G, m)$ in Table 6B exhibit basically comparable properties as those in Table 5.

5. CONCLUDING REMARKS

This paper investigates whether the bank lending is a cause for a long stagnation in Japan. That is, the paper investigates the two related questions: first, whether or not the more bank lending causes the economic growth, and second whether the effect remains for the long periods or it decays shortly. A bivariate VAR model is applied for the annual Japanese prefecture panel data set of GDP and loan from fiscal years 1975–1998. The first problem can be verified by the Granger causality test and the second problem by the impulse response function.

While there are bidirectional causalities between the loan and GDP for both Periods I and II, there is only one-directional causality from the loan to GDP and the reverse causality disappears in Period III. In other words, the more bank lending causes the economic growth in the banking slump period, while the reverse causality does not exist. The shock occurred in the loan equation of the VAR model continues to affect the levels of GDP for longer periods than the shock occurring in the GDP equation does for Period III. The results of the paper are reasonably robust against the moves of pre-specified structural break points in the VAR model.

No economic theory is provided which deduces the facts, as the previous researches (Motonishi and Yoshikawa, 1999; Meltzer, 2001; Hayashi and Prescott, 2002) did not. Therefore, a concrete model must be built to test these findings. These tasks are left to future research.
this research may be a first trial to do the fact finding for the Japanese financial slump, which makes a first step to study this issue.

However, some deduction might exist. It was possible to guess that the bad loan problem causes banks to make fewer loans which, in turn, cause growth to be slower. Then, fix the bad loan problem and growth will be higher. If the first step in the chain can be rationalized, this fact finding supports the opinion of the Council on Economic and Fiscal Policy (2001, p. 1) which is an advisory organ of the prime minister. The Council insists that the first step toward economic revitalization is the definite and final disposal of nonperforming loans.

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